



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,959	03/31/2004	Hiroataka Komatsubara	MAE 309	4883
23995	7590	03/29/2006	EXAMINER	
RABIN & Berdo, PC 1101 14TH STREET, NW SUITE 500 WASHINGTON, DC 20005			DOAN, THERESA T	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 03/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.	Applicant(s)	
10/812,959	KOMATSUBARA, HIROTAKA	
Examiner	Art Unit	
Theresa T. Doan	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 12-18 is/are pending in the application.
- 4a) Of the above claim(s) 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17:2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 01/23/06.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Newly submitted method claim 18 is directed to an invention that is independent or distinct from the invention originally claimed (claims 1-11 that have been canceled) and newly submitted device claims 12-17 for the following reasons: the product claims do not require the step of "after the first lower part and the second lower part are formed in the lower dielectric film, forming upper dielectric film in contact with the lower dielectric film" as required by the new process claim 18. Alternative, instead of first forming first and second lower parts in the lower dielectric and then forming upper dielectric film on the lower dielectric film as required by the new process claim 18, the upper dielectric film can be formed first on the lower dielectric film and then forming the first and second lower parts in the lower dielectric film after by etching upper and lower dielectric films at the same time.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 18 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2814

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 12-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsukawa (JP 404023327).

Regarding claim 12, Matsukawa (Fig. 4 of page 156) discloses a semiconductor device, comprising:

a lower dielectric film 7;

an upper dielectric film 14 formed in contact with the lower dielectric film 7;

a first interconnecting line 2 having a first lower part formed in the lower dielectric film 7 and a first upper part formed in the upper dielectric film 14, the first upper part making contact with the first lower part;

a second interconnecting line 3 having a second lower part formed in the lower dielectric film 7 and a second upper part having a portion formed in the upper dielectric film 14, the second upper part making contact with the second lower part;

wherein the first lower part of the first interconnecting line 2 and the second upper part of the second interconnecting line 3 have a first width; and

the second lower part of the second interconnecting line 3 and the first upper part of the first interconnecting line 2 have a second width greater than the first width.

Regarding claim 13, Matsukawa (Fig. 4 of page 156) discloses the first interconnecting line 2 and the second interconnecting line 3 are mutually adjacent.

Regarding claim 14, Matsukawa (Fig. 4 of page 156) discloses the first and second widths, which are constant.

Regarding claim 15, Matsukawa (Fig. 4 of page 156) discloses the first upper part, the second upper part, the first lower part, and the second lower part are rectangular.

Regarding claim 16, Matsukawa (Fig. 2a) discloses the first interconnecting line 2 and the second interconnecting line 3 have a cross-sectional T shape.

4. Claims 12-13 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Park et al. (U.S. Pat. 6,469,392).

Regarding claim 12, In Fig. 10 of Park, if the bottom half of the dielectric film 770 is interpreted as "a lower dielectric film" and the upper half of the dielectric film 770 is interpreted as "an upper dielectric film", then Park discloses a semiconductor device, comprising:

- a lower dielectric film (the bottom half of the dielectric film 770);

- an upper dielectric film (the upper half of the dielectric film 770) formed in contact with the lower dielectric film;

- a first interconnecting line 220b having a first lower part (the bottom half of the first interconnecting line 220b) formed in the lower dielectric film (the bottom half of the dielectric film 770) and a first upper part (the upper half of the first interconnecting line

220b) formed in the upper dielectric film (the upper half of the dielectric film 770), the first upper part making contact with the first lower part;

a second interconnecting line 220a having a second lower part (the bottom half of the second interconnecting line 220a) formed in the lower dielectric film (the bottom half of the dielectric film 770) and a second upper part (the upper half of the second interconnecting line 220a) formed in the upper dielectric film (the upper half of the dielectric film 770), the second upper part making contact with the second lower part;

wherein the first lower part (the bottom half of the first interconnecting line 220b) and the second upper part (the upper half of the second interconnecting line 220a) have a first width; and

the second lower part (the bottom half of the second interconnecting line 220a) and the first upper part (the upper half of the first interconnecting line 220b) have a second width greater than the first width.

Regarding claim 13, Park (Fig. 10) discloses the first interconnecting line 220b and the second interconnecting line 220a are mutually adjacent.

Regarding claim 17, Park (Fig. 10) discloses the first interconnecting line 220b and the second interconnecting line 220a have a first height and the first upper part (the upper half of the first interconnecting line 220b), the second upper part (the upper half of the second interconnecting line 220a), the first lower part (the bottom half of the first

interconnecting line 220b), and the second lower part (the bottom half of the second interconnecting line 220a) have a second height equal to half the first height.

### ***Response to Arguments***

Applicant's arguments with respect to claims 12-17 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that Park teaches forming the interconnecting lines in a single dielectric film, the reference does not disclose or suggest forming each interconnecting line in two separate dielectric films, as recited by claim 12.

Applicant's argument is not persuasive because Park (Fig. 10) discloses a dielectric film 770. Recitations a lower dielectric film and an upper dielectric film formed in contact with the lower dielectric film that fail to distinguish over Park's dielectric film 770, which can be arbitrarily subdivided into numerous sub-layers about each other. In Fig. 10 of Park, if the bottom half of the dielectric film 770 is interpreted as "a lower dielectric film" and the upper half of the dielectric film 770 is interpreted as "an upper dielectric film", then Park discloses a semiconductor device, comprising: a lower dielectric film (the bottom half of the dielectric film 770) and an upper dielectric film (the upper half of the dielectric film 770) formed in contact with the lower dielectric film, as recited in claim 12.

Applicant argues that Matsukawa teaches forming an upper part and a lower part, which formed in separate dielectric films, but which do not make contact with each other, since the upper part is separated from the lower part by the narrow middle parts.

Applicant's argument is not persuasive because the combination of the narrow middle portion and the narrow top portion of the interconnecting line 3 is interpreted as "a second upper part". Clearly, the second upper part makes both physical and electrical contact with the second lower part, and the second upper part has a narrow top portion formed in the upper dielectric film 14.

The rest of applicant's arguments have been addressed to the amended claims are considered in the rejections shown above.

### ***Conclusion.***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any



Art Unit: 2814

---

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T. Doan whose telephone number is (571) 272-1704. The examiner can normally be reached on Monday to Friday from 7:00AM - 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TD  
March 20, 2006.

  
PHAT X. CAO  
PRIMARY EXAMINER